

# Forecasting for Prescribed Fires

First Annual Smoke Management  
Meeting for Arizona  
March 14-15 2005  
Phoenix

# Forecasting

- Surface
- Upper air
- Modeling
- Written statements
- ADEQ Modeling

# Forecasting

- Surface Data
  - Temperature
  - Humidity
  - Wind Speed
  - Wind direction
  - Assess for last 24-48 hours

# Forecasting

- Source of Surface data
  - METARs (Meteorological Aeronautical Report )
    - <http://weather.uwyo.edu/surface/meteogram/>
    - <http://www.wrcc.dri.edu/>
    - <http://www.rap.ucar.edu/weather/surface/>
  - RAWS (Remote Automatic Weather Stations)
    - <http://www.fs.fed.us/raws/>
    - <http://www.met.utah.edu/roman/>
    - <http://www.wrcc.dri.edu/>
    - <http://fireweather.info/>

# Forecasting

- Upper-air data
  - Temperature
  - Humidity
  - Transport Wind Speed
  - Transport Wind direction
  - Lapse rates
  - Atmospheric Stability
  - Ventilation Index

# Forecasting

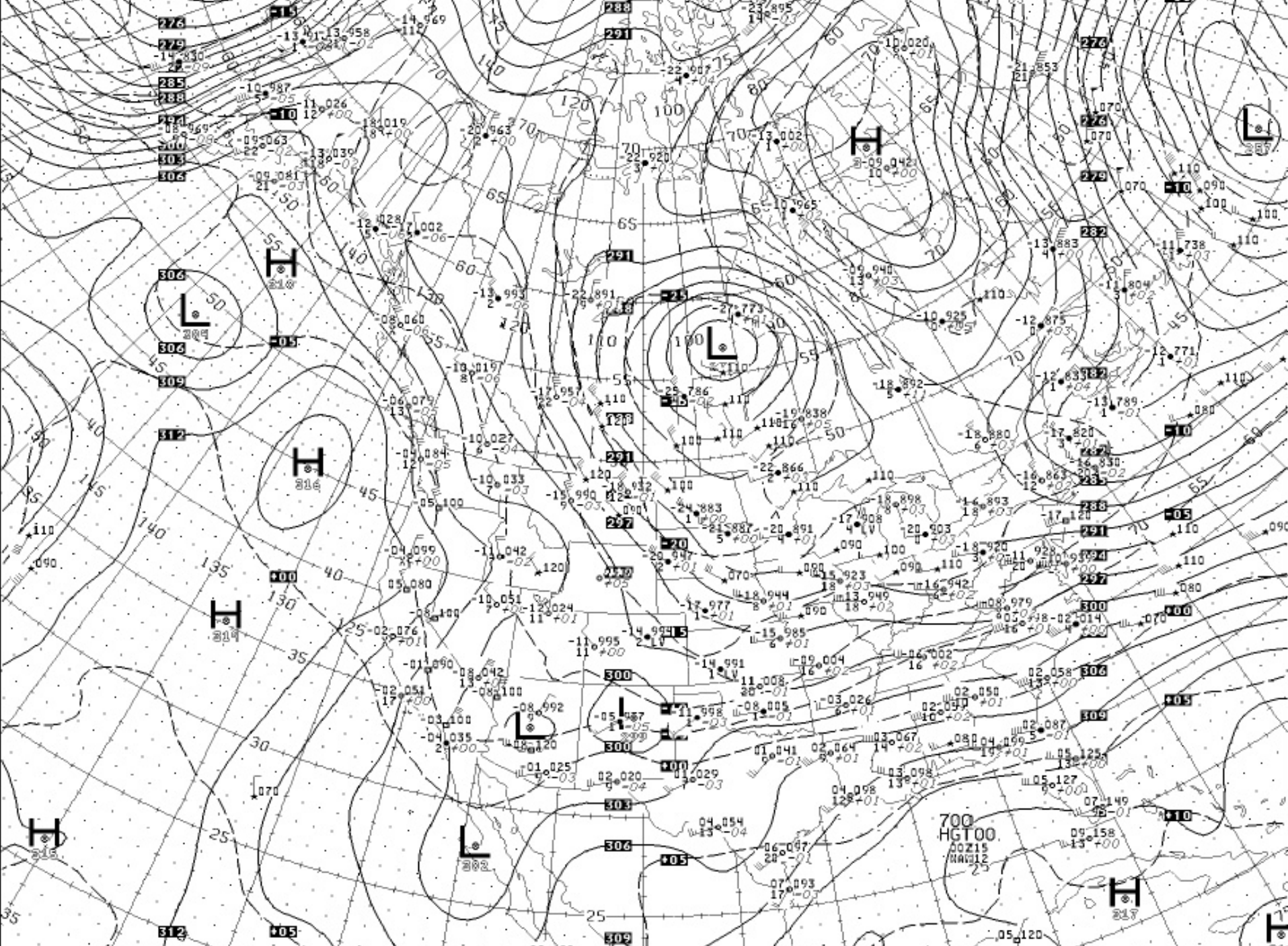
## ■ Upper Air Sources

### ■ Upper charts

- <http://weather.uwyo.edu/difax/>

### ■ Sounding Data

- <http://weather.uwyo.edu/upperair/>
- <http://www.rap.ucar.edu/weather/upper/>



0026 200MB ANALYSIS HEIGHTS/TEMPERATURE VALID 00Z TUE 15 MAR 2005

# Forecasting

- Modeling
  - Surface wind speed
  - Surface wind direction
  - Transport wind speed
  - Transport wind direction
  - High and low pressure systems
  - Forward looking



# Forecasting

## ■ Models

### ■ ETA

- <http://www.rap.ucar.edu/weather/model/>
- 60 km resolution, 84 hours forecast

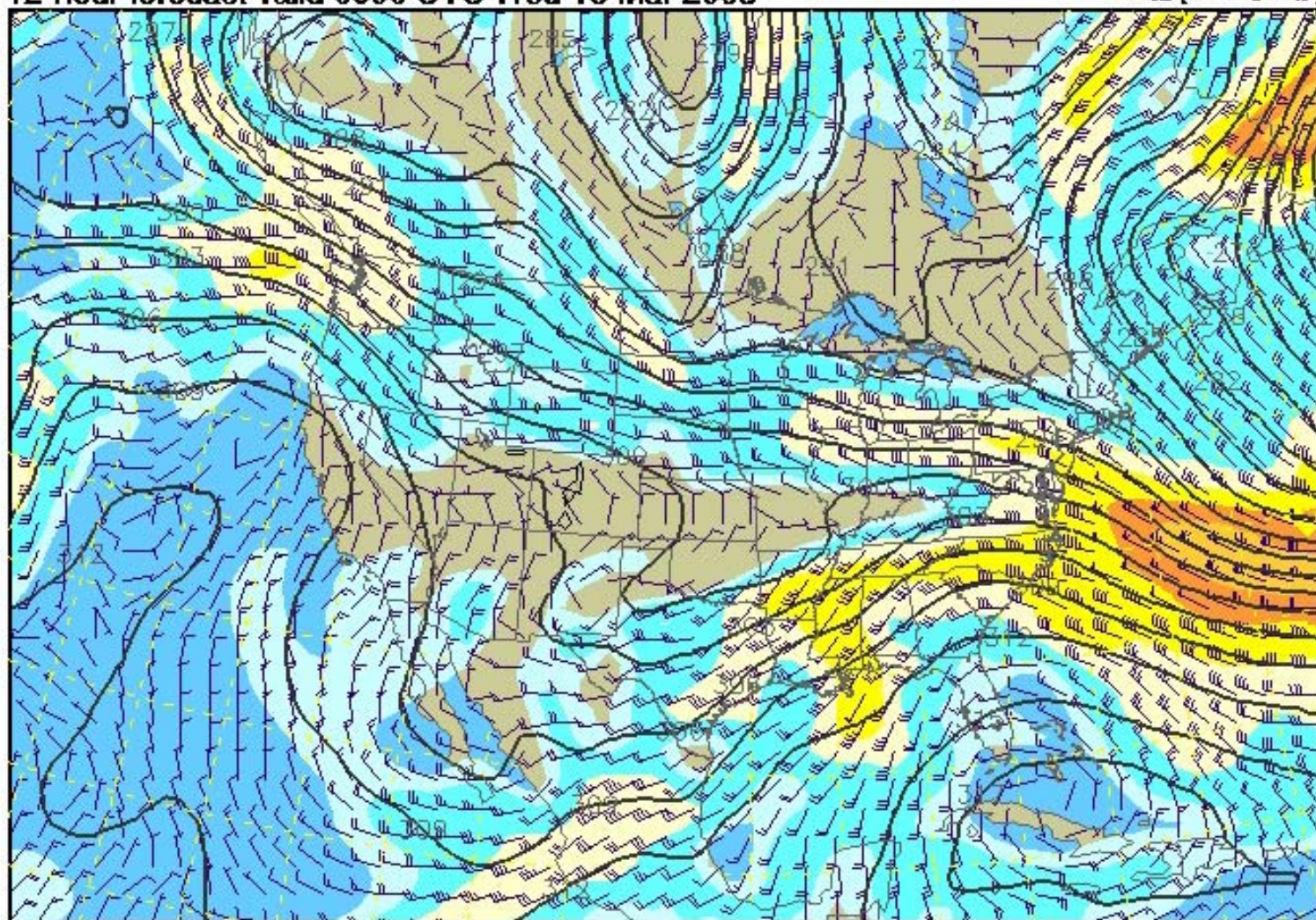
### ■ GFS

- <http://www.rap.ucar.edu/weather/model/>
- 120 km resolution, 180 forecast

### ■ MM5

- <http://www.rap.ucar.edu/weather/model/>
- Many sites, resolution variable, up to 60 forecast

## Ela (12-15 Mar)



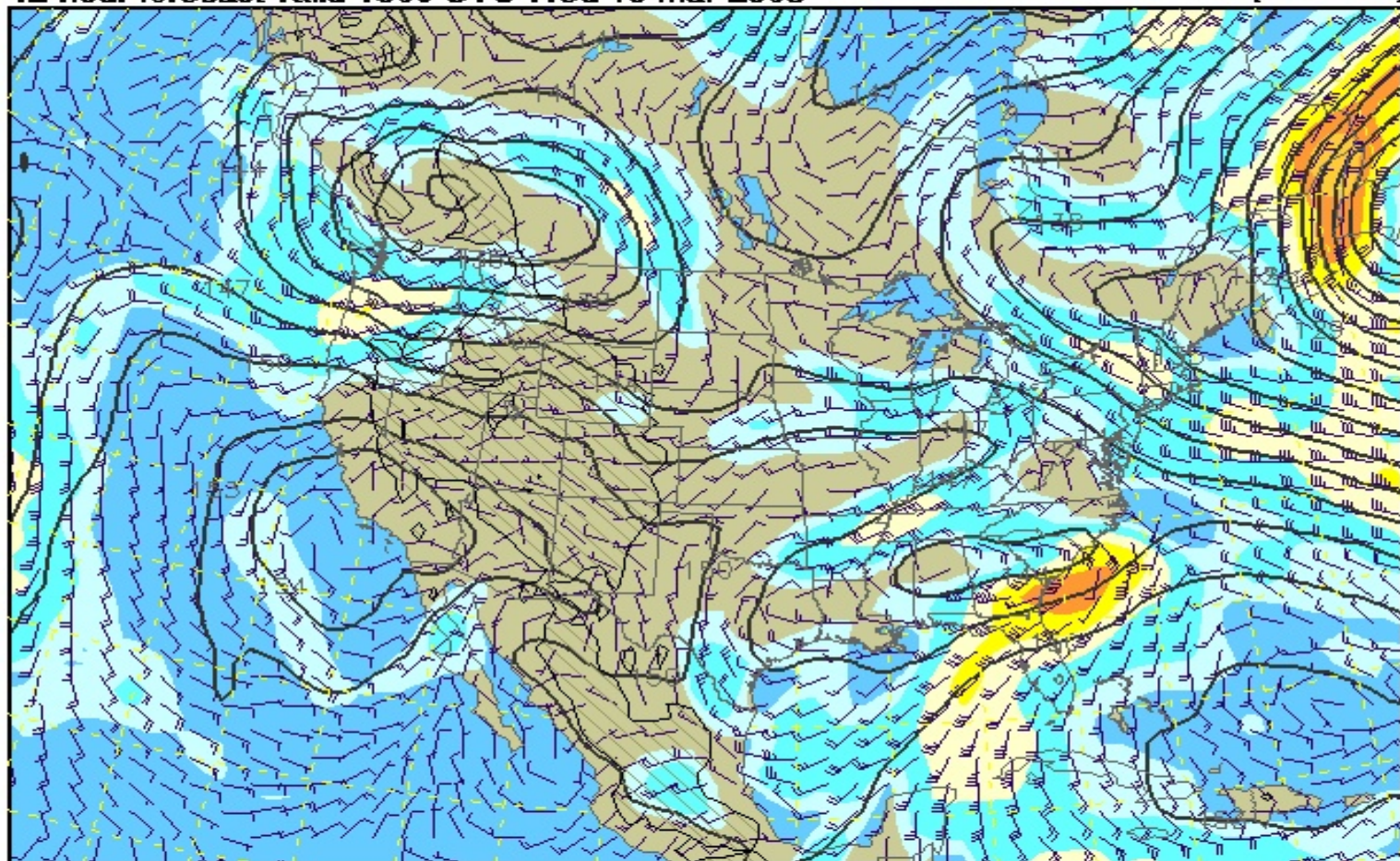
15 20 30 40 50 60 80 100 (knots)



## 850 mb Heights (dm) / Isotachs (knots)

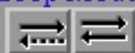
42-hour forecast valid 1800 UTC Wed 16 Mar 2005

Eta (00z 15 Mar)



15 20 30 40 50 60 80 100  
(knots)

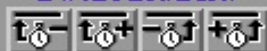
Loop Mode:



Adjust Speed:



Dwell First/Last:



Frame No: 8

# Forecasting

- Written Fire Forecast
  - General statements for weather patterns
  - Max temperature
  - Min Humidity
  - 20 feet winds
  - 10000 feet winds
  - Mixing height
  - Today, tonight and morning of next day
  - Focus on Wildland fires

# Forecasting

- ADEQ Modeling plans

- MM5

- Daily model runs
    - Higher resolution
    - Selected areas
    - Post on web page
    - Link to CALPUFF